REMARKS

The Office Action, mailed December 4, 2006, considered claims 1–23. Claim 13 was rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter. Claims 1–23 were rejected under 35 U.S.C. § 102(b) as being anticipated by Lionel Briand & Yvan Labiche, *A UML-Based Approach to System Testing* (Sep. 12, 2002) (hereinafter Briand).[1]

By this response, claims 1, 5, 13–14, 16, 18, and 21–23 are amended such that claims 1–23 remain pending. Claims 1, 14, and 18 are the independent claims which remain at issue. Support for the amendments may be found throughout the Specification, including the disclosure within Specification ¶¶ 38–61.[2]

As reflected in the claims, the present invention is generally directed toward methods and systems for generating a suite of test cases by constructing a list of all the possible subsequences of operations of a specified length and then combining those subsequences in an efficient way so as to ensure that each subsequence is covered in a test case.

Claim 1 recites, for instance, in combination with all the elements of the claim, a method of generating test cases by receiving a model which includes a list of elements representing operations to be tested. A list is also produced of subsequences of the elements in the model so that each subsequence is of a predetermined and fixed length and so that all possible subsequences of that length are represented within the list. Any subsequences which have been designated as invalid are then removed from the list. The claimed embodiment also includes generating a set of test cases from the subsequences so that each valid subsequence is represented in the set of generated test cases.

Claim 14 recites a system for generating test cases, recited in "means for" language, which represents a system embodiment similar to the method as recited in claim 1.

Claim 18 recites, in combination with all the elements of the claim, a system for generating test cases from a list of operations needing to be tested which includes a file reader

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[1] Although the prior art status of the cited art is not being challenged at this time, Applicant reserves the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

[2] However, it should be noted that the present invention and claims as recited take support from the entire Specification. As such, no particular part of the Specification should be considered separately from the entirety of the Specification.

which receives a file comprising elements to be tested and a pre-processing mechanism which produces a list of subsequences of fixed length (which is at least two). The list of subsequences produced will contain every possible subsequence of the fixed length of elements possible from the file. Finally, a selection mechanism is included which selects subsequences from the list to add to a test case and then indicates a subsequence as covered; and the selection mechanism is controlled to ensure that all subsequences have been covered within a test case.

Now, with regard to the rejections of record, it will be noted that claims 5, 16, and 21–23 were objected to because of typographical errors. The typographical errors within these claims have now been appropriately corrected. Additionally, a typographical error in the first claim, substituting "method" for "system," has also been corrected.

Claim 13 was rejected under 35 U.S.C. § 101 for being directed toward non-statutory subject matter. Claim 13 has now been amended to read "computer-readable *storage* medium" to overcome the rejection.[3]

Now, with regard to the substantive rejections, it will be noted that each of the independent claims, 1, 14 and 18, were rejected under 35 U.S.C. § 102 as being anticipated by Briand.[4] Briand discloses a UML-Based approach to system testing.[5] UML is the Unified Modeling Language™ which provides a way to model and describe computer application structure, behavior, and architecture.[6] Briand relies upon "use case sequences" – which are ordered lists of operations – to generate test cases. Briand is distinct from the present invention, among other ways, in that Briand only considers tests in the proper execution order of an application and does not consider *all possible subsequences* of operations. Further, Briand does

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[3] The Applicant respectfully disagrees, however, that data signals sent over wired and wireless media do not meet the "useful, concrete, and tangible result" test set forth in *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (cited by *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998)). Computer code recorded on magnetic media are electromagnetic signals which may be sensed by appropriate computer equipment and executed by appropriate computer processing units. So, too, is computer code conveyed by wireless means electromagnetic signals which may be sensed by appropriate computer equipment and executed by appropriate computer processing equipment. Wireless signals should be considered both "useful" and "tangible" under the test enunciated by *Alappat* and cited by *State Street Bank*. *See State Street Bank*, 149 F.3d at 1373 (citing *Alappat*, 33 F.3d at 1544). The foregoing argument notwithstanding and being mindful of the Interim Guidelines (which indicate a similar view towards wireless signals), the applicant has amended the relevant independent claim to remedy the Examiner's concern.

[4] Office Communication pp. 4, 11 (Dec. 4, 2006).

[5] *See, generally,* Briand.

[6] *See* www.uml.org.

not combine the subsequences in such a way to ensure all subsequences are tested in a more efficient or economical manner.[7]

Although both the present invention and Briand are directed toward computer systems testing, the approaches are distinct and Briand fails to include each element as claimed in the present invention. For instance, Briand fails to disclose producing a list of fixed length subsequences of elements where the list comprises every possible subsequence of the fixed number of elements. In contrast, Briand teaches that "use case sequences" are generated and the case sequences are determined from a directed graph such that each possible subsequence of elements is not included within the list.[8] Once the inclusive and exhaustive list of subsequences is generated, Briand fails to teach that invalid subsequences are removed from the list. Briand also fails to teach that test cases are then generated from the previously produced list of subsequences in such a way that each valid subsequence appears at least once among the test cases in the suite.

Contrary to the embodiments disclosed in Briand, the method recited in claim 1 will generate subsequences and test cases with elements out of the normal execution order.[9] The test cases (and test "oracles") of Briand, on the other hand, follow the order of the directed graphs from which Briand generates tests and do not produce the coverage of the present invention. The Examiner cites to Briand §§ 1–3.1 for having taught each element of the previously presented claim 1. The Applicant points out, however, that the cited section fails to disclose any particular method for determining elements, subsequences, or test cases – it merely lays a generally basis for discussion. The Applicant respectfully submits that "A7 and A8 are concerned with generating ... test cases,"[10] inter alia, fails to rise to the level of enablement required to anticipate the specific method of generating a suite of test cases as previously presented claim 1. As can be appreciated, both Briand and the present invention ultimately produce "test cases." However, the specific method by which the tests are produced are demonstrably distinct between the present invention as claimed and that of Briand. In view of the above discussion, because Briand fails to teach each and every element of the invention as claimed, the Applicant respectfully submits that

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[7] This is an inherent artifact of the invention as claimed. The subsequences are included in test cases until all are covered - without regard as to the order they would appear in a Briand-style "use case sequence."

[8] See Briand §§ 3–4.

[9] This follows from generating a list of subsequences which includes "each subsequence of elements of length equal to the fixed number...." Claim 1.

[10] Briand § 2; see Office Comm. p. 4.

a rejection under 35 U.S.C. § 102 in view of Briand is not proper. Correspondingly, the Applicant submits that claim 1 is in condition for allowance and respectfully requests the Examiner to issue its allowance.

Claim 14 was rejected under 35 U.S.C. § 102 as being anticipated by Briand following generally the discussion of claim 1.[11] The Applicant respectfully submits that Briand, as cited by the Examiner and its entirety, fails to teach the indicated elements of the claim. Briand Fig. 2 discloses "use case sequential constraints"[12] which does not teach a system for generating test cases. Briand Fig. 2 is merely an illustration, employed by Briand, of an example system which *is to be tested.*[13] Further, "testing an entire system,"[14] as quoted from Briand, does not disclose a system for producing test cases. In contrast, it alludes to the system *to be tested,*[15] not to the system for producing test cases which is the object of claim 14. Additionally, the discussion as applied to claim 1 applies equally to claim 14. Accordingly, because Briand fails to teach each and every element of the invention as claimed, the Applicant respectfully submits that a rejection of claim 14 under 35 U.S.C. § 102 in view of Briand is not proper. Correspondingly, the Applicant submits that claim 14 is in condition for allowance and respectfully requests the Examiner to issue its allowance.

Claims 18–23 were rejected under 35 U.S.C. § 102 as being anticipated by Briand following generally the discussion of claims 1 and 14.[16] The Applicant respectfully submits that Briand, as cited by the Examiner and its entirety, fails to teach the indicated elements of the claim. The Examiner cited the same material as claim 14 so, accordingly, the discussion above applies equally. Correspondingly, because Briand fails to teach each and every element of the invention as claimed, the Applicant respectfully submits that a rejection of claim 18–23 under 35 U.S.C. § 102 in view of Briand is not proper. Correspondingly, the Applicant submits that claims 18–23 are in condition for allowance and respectfully requests the Examiner to issue their allowance.

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[11] Office Comm. p. 11.
[12] Briand Fig. 2.
[13] *See* Briand § 3.1.1.
[14] Office Comm. p. 11
[15] *See* Briand, Abstract.
[16] Office Comm. p. 11.

The remaining claims are dependent claims based upon claims 1 or 14. Correspondingly, in view of claims 1 and 14 being in condition for allowance, each of the dependent claims based upon claims 1 and 14 should, also, be in condition for allowance.

In view of the foregoing, Applicant respectfully submits that the other rejections to the claims are now moot and do not, therefore, need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as Applicant acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice. Instead, Applicant reserves the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, Applicant specifically requests that the Examiner provide references supporting the teachings officially noticed, as well as the required motivation or suggestion to combine the relied upon notice with the other art of record.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney.

Dated this 5th day of March, 2007.

Respectfully submitted,

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